

App. Serial No.: 10/784,102
Atty. Docket No.: 0025-013

IN THE CLAIMS

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Please amend the claims as follows:

1. (currently amended) A camera module apparatus, comprising:
 - a camera integrated circuit chip;
 - a lens; and
 - a molding made on the camera integrated circuit chip for holding the lens such that the lens is positioned in relation to the camera integrated circuit chip by the molding, the molding ~~including~~ defining a recess and a spacer, the recess for receiving the lens ~~[[;]] and a spacer the spacer located within the recess and~~ adjacent a top surface of the camera integrated circuit chip, ~~the spacer and~~ separating the lens and the camera integrated circuit chip.
2. (original) The camera module apparatus of claim 1, wherein:
 - the camera integrated circuit chip is mounted on a printed circuit board.
3. (previously presented) The camera module apparatus of claim 1, further comprising:
 - a protective cover over the camera integrated circuit chip.
4. (canceled)
5. (original) The camera module apparatus of claim 3, wherein:
 - the protective cover is a glass sheet.
6. (canceled)
7. (original) The camera module apparatus of claim 1, wherein:
 - the lens is held in place on the molding by an adhesive.
8. (previously presented) The camera module apparatus of claim 1, wherein:
 - the spacer positions the lens relative to the camera integrated circuit chip.

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9. (currently amended) An integrated camera circuit and lens module, comprising:
- a camera integrated circuit;
 - a lens assembly; and
 - a holder made at least partially on the camera integrated circuit, the holder defining a spacer~~[[;]] a spacer located within the holder and located~~ adjacent a top surface of the camera integrated circuit, the spacer separating the lens assembly and the camera integrated circuit; and
- wherein the lens assembly is affixed to the camera integrated circuit via the holder, the holder enabling the insertion of the lens assembly into the holder, thereby positioning the lens assembly with respect to the camera integrated circuit.
10. (previously presented) The integrated camera circuit and lens module of claim 9, wherein:
- the lens assembly is rigidly affixed to the camera integrated circuit via the holder; and
 - the spacer causes a gap between at least a portion of the lens assembly and a sensor array of the camera integrated circuit.
11. (previously presented) The integrated camera circuit and lens module of claim 9, wherein:
- the holder is a molded component.
12. (previously presented) The integrated camera circuit and lens module of claim 11, wherein:
- the lens assembly is attached to the holder by an adhesive.
13. (previously presented) The integrated camera circuit and lens module of claim 9, wherein:
- the camera integrated circuit is mounted on a circuit board.
14. (previously presented) The integrated camera circuit and lens module of claim 9, further comprising:
- a protective cover held in place over the camera integrated circuit by the holder.

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15. (canceled)
16. (original) The integrated camera circuit and lens module of claim 14, wherein:
the protective cover is a glass sheet.
17. (currently amended) A method for producing a camera module, comprising:
molding a receptacle over an integrated circuit such that the receptacle is capable of
receiving a lens assembly and positioning the lens assembly with respect to the
integrated circuit, the receptacle defining a spacer capable of separating the lens
assembly and the integrated circuit, the spacer located adjacent a top surface of the
integrated circuit;
~~providing a spacer within the receptacle and adjacent a top surface of the integrated
circuit;~~
inserting the lens assembly into the receptacle; and
securing the lens assembly into the receptacle; ~~and wherein the spacer separates the lens
assembly and the integrated circuit.~~
18. (original) The method of claim 17, wherein:
the lens assembly is secured to the receptacle by an adhesive.
19. (original) The method of claim 17, wherein:
the integrated circuit is secured to a circuit board before the receptacle is molded over the
integrated circuit.
20. (original) The method of claim 17, wherein:
the receptacle includes a recessed portion for receiving the lens assembly.

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21. (currently amended) The method of claim 20, wherein:
 ~~the spacer is located within the recessed portion;~~
 ~~the spacer is molded as part of the receptacle; and~~
 the spacer is a projection that fixes the distance of the lens assembly from the integrated circuit.
22. (original) The method of claim 17, wherein:
 the camera module is affixed to a flex circuit.
23. (original) The method of claim 17, further comprising:
 placing a protective cover over the integrated circuit.
24. (previously presented) The method of claim 23, wherein:
 the placing of the protective cover over the integrated circuit occurs during the molding of the receptacle over the integrated circuit.
25. (canceled)
26. (original) The method of claim 23, wherein:
 the protective cover is a glass plate.

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27. (currently amended) A camera apparatus, comprising:
- an integrated circuit camera apparatus having thereon a photosensitive array;
 - a lens assembly for focusing light on the photosensitive array; and
 - a spacer separating the lens assembly and the integrated circuit camera apparatus; and
- wherein
- the lens assembly is positioned and rigidly affixed on the integrated circuit camera apparatus by a lens assembly receiving apparatus made integrally on the integrated circuit camera apparatus; and
 - the spacer is an integral portion of the lens assembly receiving apparatus, the spacer located ~~within the lens assembly receiving apparatus and~~ adjacent a top surface of the integrated circuit camera apparatus.
28. (original) The camera apparatus of claim 27, wherein:
- the lens assembly has a housing for receiving at least one lens.
29. (original) The camera apparatus of claim 27, wherein:
- the lens assembly has a housing for receiving two lenses.
30. (original) The camera apparatus of claim 27, wherein:
- the integrated circuit camera apparatus is affixed to a circuit board.
31. (previously presented) The camera apparatus of claim 27, wherein:
- the integrated circuit camera apparatus is affixed to a circuit board; and
 - the lens assembly receiving apparatus is formed at least partially on the circuit board.
32. (original) The camera apparatus of claim 31, wherein:
- the lens assembly receiving apparatus is a molded receptacle.
33. (original) The camera apparatus of claim 31, wherein:
- the lens assembly is rigidly affixed within the lens assembly receiving apparatus.

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34. (original) The camera apparatus of claim 31, wherein;
the lens assembly is affixed within the lens assembly receiving apparatus by an adhesive.
35. (previously presented) The camera apparatus of claim 27, further comprising:
a protective cover fixed between the integrated circuit camera apparatus and the lens
assembly by the lens assembly receiving apparatus.
36. (canceled)
37. (original) The camera apparatus of claim 35, wherein:
the protective cover is a glass plate.
38. (previously presented) The camera apparatus of claim 35, wherein:
the lens assembly receiving apparatus is an overmold formed over the integrated circuit
camera apparatus.
39. (currently amended) A camera module apparatus, comprising:
a camera integrated circuit chip;
a lens; and
means for holding the lens such that the lens is positioned in relation to the integrated
circuit chip by the means for holding the lens, the means for holding the lens
including a component molded on the camera integrated circuit chip[[]] ; and
wherein the component molded on the camera integrated circuit chip includes a means
for separating the lens and the camera integrated circuit chip, the means for separating
disposed within the component molded on the camera integrated circuit chip.
40. (previously presented) The method of claim 17, wherein:
the molding of the receptacle over the integrated circuit includes contacting a top surface
of the integrated circuit with a mold insert.

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41. (previously presented) The method of claim 40, wherein:
the mold insert includes a compliant surface to protect the integrated circuit.
42. (previously presented) The method of claim 17, wherein:
the molding of the receptacle over the integrated circuit includes simultaneously molding
a receptacle over each of a plurality of integrated circuits.
43. (previously presented) The method of claim 17, wherein:
the molding of the receptacle over the integrated circuit occurs at a time when the
integrated circuit is physically coupled to other integrated circuits.
44. (previously presented) The method of claim 43, wherein:
the molding of the receptacle over the integrated circuit includes simultaneously molding
receptacles over at least some of the other integrated circuits.
45. (previously presented) The method of claim 43, wherein:
the integrated circuit and the other integrated circuits are physically coupled by being
mounted on a unitary substrate; and
the integrated circuit and the other integrated circuits are subsequently separated by
dividing the unitary substrate.
46. (previously presented) The camera module apparatus of claim 1, wherein:
the top surface of the camera integrated circuit chip includes a sensor array; and
the molding is made on the top surface.
47. (previously presented) The integrated camera circuit and lens module of claim 9, wherein:
the top surface of the camera integrated circuit includes a sensor array; and
the holder is made on the top surface.

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48. (previously presented) The camera apparatus of claim 27, wherein:
the photosensitive array is on the top surface of the integrated circuit camera apparatus;
and
the lens assembly receiving apparatus is made on the top surface.
49. (canceled)
50. (previously presented) The camera module apparatus of claim 1, wherein:
the spacer fixes the distance between the lens and the camera integrated circuit chip.
51. (previously presented) The camera module apparatus of claim 3, wherein:
the protective cover is located between the spacer and the top surface of the camera integrated circuit chip; and
the spacer retains the protective cover on the camera integrated circuit chip.
52. – 53. (canceled)
54. (previously presented) The integrated camera circuit and lens module of claim 9, wherein:
the spacer fixes the distance between the lens assembly and the camera integrated circuit.
55. -60. (canceled)
61. (previously presented) The method of claim 17, wherein:
the spacer fixes the distance between the lens assembly and the integrated circuit.
62. (previously presented) The method of claim 23, wherein:
the protective cover is located between the spacer and the top surface of the integrated circuit; and
the spacer retains the protective cover over the integrated circuit.
63. – 64. (canceled)

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65. (currently amended) The camera apparatus of claim 35, wherein:

~~the spacer is part of the lens assembly receiving apparatus; and~~
the protective cover is retained between the spacer and the integrated circuit camera apparatus.

66. (canceled)

67. (currently amended) The camera apparatus of claim ~~[[66]]~~ 27, wherein:

the lens assembly receiving apparatus is an overmold formed over the integrated circuit camera apparatus; and
the spacer is part of the lens assembly receiving apparatus overmold.

68. (previously presented) The camera apparatus of claim 27, wherein:

the spacer fixes the distance between the lens assembly and the integrated circuit camera apparatus.

69. – 70. (canceled)

71. (new) A camera module apparatus, comprising:

a camera integrated circuit chip including a sensor array;
a lens;
a molding made on the camera integrated circuit chip for holding the lens such that the lens is positioned in relation to the camera integrated circuit chip by the molding, the molding including a recess for receiving the lens; and
an optically clear spacer located within the recess and adjacent a top surface of the camera integrated circuit chip, the spacer separating the lens and the camera integrated circuit chip when the lens is placed in the recess.

72. (new) A camera module apparatus of claim 71, wherein:

the optically clear spacer is a protective cover positioned over the sensor array.

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73. (new) A camera module apparatus of claim 72, wherein:
the optically clear spacer is glass.
74. (new) A camera module apparatus of claim 71, wherein:
the optically clear spacer abuts both the camera integrated circuit chip and the lens.
75. (new) A camera module apparatus of claim 71, wherein:
the optically clear spacer is mounted over the camera integrated circuit chip before the molding is made.
76. (new) A camera module apparatus of claim 71, wherein:
the optically clear spacer is mounted over the camera integrated circuit chip at the same time the molding is made.
77. (new) A camera module apparatus of claim 71, wherein:
the camera integrated circuit chip is mounted on a printed circuit board.
78. (new) A camera module apparatus of claim 71, wherein:
the camera integrated circuit chip is mounted on a flex circuit.
79. (new) A camera module apparatus of claim 71, wherein:
the spacer fixes the distance between the lens assembly and the camera integrated circuit chip.
80. (new) A camera module apparatus of claim 71, wherein:
the lens is part of a lens assembly.
81. (new) A camera module apparatus of claim 71, wherein:
the lens assembly has a housing for receiving said lens.